

Claims

1. A piezoelectric actuator, having

- a multilayer construction of piezoelectric layers perpendicular to the action direction (6, 7) inner electrodes (2, 3), which are located between the piezoelectric layers and can be acted upon by an electrical voltage for actuating the piezoelectric actuator via outer electrodes, and having

- further piezoelectric layers with inner electrodes (8, 9), at which an electrical sensor signal proportional to the actuation of the piezoelectric actuator (1) can be picked up via further outer electrodes (10, 11; 21, 22, 23, 24), characterized in that

- the piezoelectric layers for the actuator part and the piezoelectric layers for the at least one sensor part are integrated in one component as a piezoelectric actuator (1) in such a way that individual sensor piezoelectric layers are located at predetermined spacings or locations between the piezoelectric layers for the actuator part.

2. The piezoelectric actuator according to claim 1, characterized in that

- when the cross section of the piezoelectric actuator (1) is rectangular, the electrically positive and negative outer electrodes (4, 5) of the actuator part and the electrically positive and negative outer electrodes (10, 11; 21, 22, 23, 24) of the sensor part are each mounted on diametrically opposite sides of the piezoelectric actuator (1).

3. The piezoelectric actuator according to claim 2, characterized in that
 - in the case of a plurality of sensor parts each individually contacted with outer electrodes, the various sensor piezoelectric layers (12, 13; 14, 15, 16) of the sensor parts are located side by side in a plane transverse to the action direction (6, 7); and that
 - in these sensor parts, the inner electrodes (8, 9) having the same polarity in the action direction (6, 7) of the piezoelectric actuator (1) are contacted parallel to one another, on one side of the piezoelectric actuator (1), with outer electrodes.
4. The piezoelectric actuator according to claim 2 or 3, characterized in that
 - both the outer electrodes (4, 5) of the actuator part and the outer electrodes (10, 11) of the at least one sensor part are located side by side on two diametrically opposite sides of the piezoelectric actuator (1).
5. The piezoelectric actuator according to one of the foregoing claims, characterized in that
 - the inner electrodes (17, 18, 19, 20) of the at least one sensor part are located in the corner region and are each contacted there with outer electrodes.
6. The piezoelectric actuator according to claim 5, characterized in that
 - in the case of a plurality of sensor parts, the various inner electrodes (17, 18, 19, 20) are contacted in alternation with outer electrodes on different flanks of the corner region.

7. The piezoelectric actuator according to one of the foregoing claims, characterized in that

- a plurality of sensor elements connected in series are connected electrically parallel; and/or that
- a plurality of actuator elements connected in series are connected electrically parallel.